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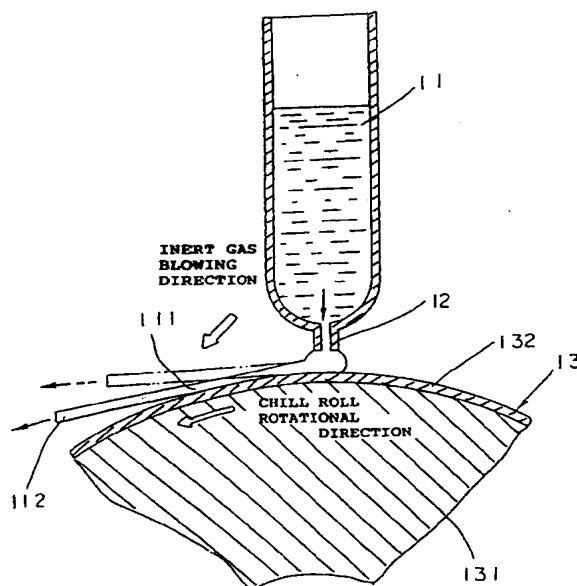
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**D-82116 Gräfelfing (DE)**(54) **Permanent magnet material and method for making.**

(57) A melt of Nd-Fe-B alloy is injected in an inert gas atmosphere through a nozzle against a chill roll or a pair of chill rolls rotating relative to the nozzle for contacting the melt with the circumference of the chill roll or rolls, thereby quenching the melt. The chill roll has a low heat conductivity surface layer around a base or has a predetermined surface roughness on its circumference. The contact time of the melt with the chill roll can be increased by blowing an inert gas flow. Further the melt is quenched in an inert gas atmosphere of up to 1 Torr. A wind shield is disposed in proximity to the chill roll circumference for preventing a wind of the ambient gas induced by rotation of the chill roll from reaching a paddle of the melt. With these means, there is obtained a permanent magnet material having a narrow grain diameter distribution.

FIG. 1

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## EUROPEAN SEARCH REPORT

Application Number

EP 91 11 8669

### DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0 341 435 (OVONIC SYNTHETIC MATERIALS COMP.) * column 19, line 38 - column 20, line 19; claims 1,4; figures 5-6 * ---	1,2,26, 29	H 01 F 1/053 H 01 F 41/02
A	PATENT ABSTRACTS OF JAPAN vol. 14, no. 270 (C-0727)12 June 1990 & JP-20 80 538 ( HTACHI METALS LTD ) 20 March 1990 * abstract * ---	1,2,11, 26	
E	PATENT ABSTRACTS OF JAPAN vol. 16, no. 195 (M-1246)12 May 1992 & JP-40 28 457 ( TDK CORP ) 31 January 1992 * abstract * -----	1,26,27	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			H 01 F
Place of search	Date of completion of the search	Examiner	
THE HAGUE	27-04-1993	DECANNIERE L J N	
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

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### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid.
- namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions.

namely:

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- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid.
- namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.

namely claims: 1-11, 26-33



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#### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-11,26-33: Magnet material and first method (roughness)
2. Claims 12-25 : Second method (heat conductivity)
3. Claims 34-40 : Third method (blowing gas)
4. Claim 41 : Fourth method (atmosphere)
5. Claims 42-45 : Fifth method (wind shield)